

Application No. 10/510,534

Filed: April 20, 2005

TC Art Unit: 1744

Confirmation No.: 2313

REMARKS

Claims 1-4 are currently pending. Claims 1-4 stand rejected under 35 U.S.C. § 103(a). The claims are also provisionally rejected for double-patenting. This issue will be addressed when and if it becomes final. Claims 1-2 have been amended. Claims 5 and 6 have been newly added. Accordingly, after entry of the amendment, the pending claims will be claims 1-6. The Applicant believes that the grounds for rejection are now moot and respectfully requests withdrawal of the same.

FORMAL MATTERS

A English translation of Japanese Published Laid-Open Patent Application 3226-1991 is provided herewith. The Applicant respectfully requests that the Examiner consider the reference prior to issuance of a subsequent Official Action on the merits.

SECTION 103(a) REJECTIONS

Claims 1 and 3 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Number 6,108,847 to Cueman, et al. ("Cueman") in view of U.S. Patent Number 5,409,714 to Ishijima ("Ishijima") and claims 2 and 4 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Number 6,264,936 to Sawan, et al. ("Sawan") in view of Ishijima. The Applicant respectfully traverses the grounds for these rejections in view of the above amendments and for the reasons provided below.

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Claims 1 and 3

Claim 1 has been amended to recite that the pulverized shell products are more densely distributed on outside surfaces of bristles and/or on the outside surface of the handle. Support is found at page 6, lines 15-24. The Cueman reference merely teaches embedding a chemical compound antimicrobial agent into the batch of the polymeric material to be used in the manufacture of the toothbrush handle. See, e.g., Cueman, col. 1, lines 63-66; col. 4, lines 41-56. Hence, the antimicrobial agent is evenly distributed throughout the matrix of the handle. The Cueman reference, further, discloses that the antimicrobial agent selected is of a type that will migrate into the bristles of the toothbrush. See, e.g., Id., col. 5, lines 20-57. Accordingly, the Cueman reference does not teach, mention or suggest distributing the pulverized shell products more densely on the outer surface of the brush and/or bristles than the interior.

Nor does the Ishijima reference make up for the shortcomings of the Cueman reference. Ishijima is relied on for teaching calcium oxide-type calcined antimicrobial agents and calcium oxide-type calcined antimicrobial agents in combination with calcium carbonate additives. Ishijima, however, does not teach, mention or suggest distributing the pulverized shell products more densely on the outer surface of the brush and/or bristles. Furthermore, there is nothing in Ishijima or Cueman to suggest that calcium oxide-type antimicrobial agents can be substituted for the chemical compounds taught by Cueman or that calcium oxide-type antimicrobial agents in the polymeric material matrix would migrate as the chemical compound agents migrate.

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Accordingly, claims 1 and 3 satisfy all of the requirements of 35 U.S.C. § 101, et seq., especially § 103(a), and are in condition for allowance. Withdrawal of the rejections is respectfully requested.

#### Claims 2 and 4

The Sawan reference teaches forming a non-leaching, antimicrobial coating/layer on the surface of a substrate (e.g., an antimicrobial metallic material deposited on an organic, polycationic polymer material) to kill microorganisms that contact the coating/layer without releasing biocides into the surrounding environment. Although Ishijima is relied on for teaching use of calcium oxide-type calcined antimicrobial agents and calcium oxide-type calcined antimicrobial agents in combination with calcium carbonate additives, combining Ishijima's calcined agents with Sawan would defeat the purpose of the latter. Indeed, Sawan teaches a non-leaching layer that does not release biocides into the environment, while Ishijima teaches agents that are inherently "leaching". Consequently, the Examiner's combination of Sawan in view of Ishijima is improper under 35 U.S.C. § 103(a).

Accordingly, claims 2 and 4 satisfy all of the requirements of 35 U.S.C. § 101, et seq., especially § 103(a), and are in condition for allowance. Withdrawal of the rejection is respectfully requested.

#### Claims 5 and 6

Claims 5 and 6 recite that the shell is a scallop shell. See, e.g., Specification, page 4, line 13. Neither Sawan nor Ishijima teaches, mentions or discloses using a scallop shell.

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Accordingly, the Applicant believes that claims 5 and 6 are allowable.

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The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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Japanese Utility Model Laid Open No. 3-3226.

Application date: May 31, 1989.

Open Date: January 14, 1991.

Applicant: the Lion Co. Ltd.

Inventor: Tatsu Ito.

## Specification

## 1. Title of the invention

Bristle of Toothbrush

## 2. Claims

1. A bristle for toothbrush, said bristle comprising an bi-layer of an inner and outer layer, said outer layer being mixed with one or more than one of effective ingredients selected from disinfectant, an antibacterial agent, a medicament, an abrasive agent, a surfactant and a perfume.

## 3. Detailed description of the invention

## Field of Industrial Use

This invention relates to bristle used for a toothbrush.

## Prior Art

A conventional bristle for a toothbrush has disinfection, anti-bacterial ness or anti-polishing, such bristle comprising entirely of an uni-layer or a bi-layer, one or more than one of effective ingredients such as a disinfectant, an antibacterial agent, a medicament, an abrasive agent, a surfactant and a perfume being mixed thereinto and held by the following two conventional methods 1 and 2 roughly classified:

1. A bristle is impregnated with a solution obtained by dissolving the effective

agent into a solvent or coated by spraying such solution thereon to obtain a coated outer layer of the bristle.

2. Spinning a bristle out of a resin mixed with an effective agent.

A problem to be solved with the invention

However, in the aforementioned method 1, as the effective ingredients adhered to only the surface of the bristle or as a very thin surface layer on the bristle, the adhered ingredients are easily removed by only several rubbings of toothbrush resulting in a non-consistency of effect, and in the method 2, much amount of effective ingredients is necessary to obtain the effect because the most ingredients are deep within the interior of the bristle and not on the surface, therefore the bristles are deteriorated and inferior in durability because of high loading of the ingredients into the resin.

Therefore, in the invention, there is provided a bristle usable under a long term and having less deterioration due to incorporation of a small amount of ingredients.

Means for solving the problem

In order to solve the aforementioned problem, the invention provide a bristle for toothbrush, said bristle comprising bi-layers of outer and inner layers, said outer layer being mixed with one or more than one of effective ingredients selected from a disinfectant, an antibacterial agent, a medicament, an abrasive agent, a surfactant and a perfume.

Operation

The effective ingredients incorporated into the outer layer exert their specific effects during the use of toothbrush and, the inner layer supports the outer layer and also prevents deterioration of a mechanical property of the outer layer.

Examples

In the 1<sup>st</sup> to Fourth examples shown in figures, the brush 1 comprises the inner layer 2 and the outer layer 3 into which one or more than one of effective ingredients 4 such as a disinfectant, an antibacterial agent, a medicament, an abrasive agent, a surfactant and a perfume is mixed.

The inner and outer layers 2, 3 are respectively composed of a resin, the outer layer 3 accounting for 5 to 40 % in total and being produced by spinning the resin blended with 3 to 30 % of the effective ingredients, and a weight ratio of the outer layer mixed with the effective ingredients accounts for at least 40 % or below in total, preferably accounts for 20 % or below in total.

In such toothbrush 1, the effective ingredients incorporated into the outer layer 3 continue to exert its specific effect until the outer layer is consumed entirely and the inner layers supports such outer layer from inwards to maintain its properties thereby the use of toothbrush continues to be in effect even after consumption of the entire outer layer.

In the aforementioned case, the inner layer is semi-solid and the outer layer is soft and vice versa.

In such aforementioned bristle, 1<sup>st</sup> example in Fig. 1 shows the outer and inner layers 2, 3 are formed in a concentric circle, 2<sup>nd</sup> example in Fig. 2 shows the inner layers 2 is in a cylindrical form though the outer layer 3 is a polygonal form and 3<sup>rd</sup> example in Fig. 3 shows the inner layer 2 is a polygonal form and the outer layer 3 is a cylindrical form to the contrary to the 2<sup>nd</sup> example and the Fourth example in Fig. 4 shows the inner layer 2 is a polygonal form and the outer layer 3 forms a petal. Since those are just examples and needless to say, any other deformable examples are within the scope of the invention.

As an example for an abrasive bristle, calcium carbonate, calcium pyrophosphate, and silicone dioxide as abrasive agents were used in the prior art and the invention of toothbrush respectively and the properties of the toothbrush thus obtained were also surveyed.



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As a result thereof, the conventional toothbrushes comprising a uni-layer show little effect even in case that 5 to 6 % or more of the effective ingredients is incorporated. Though incorporation of more amounts in effective ingredients shows some effects, mechanical properties of bristles deteriorate and the bristles thus obtained become inferior to durability and are not usable during a long term.

To the contrary, in the bristle of the invention, the outer layer 3 can be incorporated into at least 10 % of abrasive agents, thereby to enable the toothbrush to withstand a long-term use with supporting the inner layer 2 resulting in high performance of an enough abrasive effects.

#### Effect of the invention

Since the toothbrush of the invention, as above, an inner and outer bi-layer, the outer layer being incorporated with one or more than one of the effective ingredients, the effective ingredients incorporated into the outer layer may exert its specific effect until its consumption of the outer layer, thus the inner layer may support the outer layer from inward and may maintain its properties thereby to enable a long term use thereof as a result entirely.

#### 4. Brief description of the Drawings

Fig. 1 to Fig. 4 is a partial longitudinal section.

- 1 a bristle, 2 an inner layer, 3 an outer layer,  
4 an effective ingredient

公開実用平成 3-3226

引用例 CHAF-2002  
-PCT

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⑩ 日本国特許庁(JP)

⑪ 実用新案出願公開

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